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On Bigeneric Orchid Hybrids. By ROBERT ALLEN ROLFE, A.L.S., Assistant in the Herbarium of the Royal Gardens, Kew.

[Read 5th May, 1887.]

(PLATE IV.)

*Zygocolax* × *Veitchii*, Rolfe\*, is a remarkable bigeneric hybrid which recently flowered in the Royal Exotic Nursery of Messrs. James Veitch and Sons at Chelsea. It was raised by Mr. Seden, the well-known hybridist, by crossing *Zygopetalum crinitum*, Lodd., with the pollen of *Colax jugosus*, Lindl., the seed having been sown in April 1882. The two parents are somewhat diverse in structure, as the accompanying Plate IV. will show. In Bentham and Hooker's 'Genera Plantarum,' however, *Colax* is reduced as a synonym of *Lycaste*, a course which hardly seems warranted by the structure of the two; so that for the purpose of the present paper I have treated *Colax* as a distinct genus.

The diversity in structure between this genus and *Zygopetalum* renders the occurrence of a hybrid between them a matter of considerable interest, especially as hybrids generally are known to be more or less intermediate between the two parents. This case is no exception to the general rule, as the accompanying Plate will show. The flower, in shape, is tolerably intermediate between the two parents, the coloration most closely resembling that of the seed-parent, and the pollinarium approaching rather that of the pollen-parent.

Being so far intermediate between the two parents, the question arose as to how the plant should be treated in the scheme of classification. Several bigeneric hybrids of Orchidaceæ have been artificially produced; and looking for the precedents adopted in these cases, I found the information respecting them to be very vague, and the nomenclature generally unsatisfactory. So that instead of confining my remarks to *Zygocolax*, I have extended the paper so as to include other bigeneric hybrids of the Order, and have specially considered the subject in its general bearing upon classification.

The way in which bigeneric hybrids of Orchidaceæ have hitherto been treated (omitting specific details) may be briefly summarized as follows, the seed-parent being enumerated in the left-hand

\* Gard. Chron. 1887, pt. 1, p. 765.

column, the pollen-parent in the middle, and the hybrid (or result) in the right-hand one:—

Seed-parent.	Pollen-parent.	Hybrid.
Phaius.	Calanthe.	Phaius.
Anæctochilus.	Goodyera *	Anæctochilus.
Goodyera*.	Anæctochilus.	Goodyera.
Cattleya.	Lælia.	Cattleya (in one case).
Cattleya.	Lælia.	Lælia (in four cases).
Lælia.	Cattleya.	Lælia.
Cattleya.	Sophronitis.	Lælia.

The result obtained from a study of the above Table is somewhat curious. If *Phaius* be crossed with *Calanthe*, a *Phaius* is the result; though we have no example of what would happen were the cross effected the reverse way. The next two cases, however, supply this deficiency, as *Goodyera* and *Anæctochilus* may be crossed either way, the result depending entirely on which way the cross is effected.

Thus far the influence has been on the side of the seed-parent, a result with which *Lælia* crossed with *Cattleya* also agrees. But when the cross is effected the reverse way, *Lælia* becoming the pollen-parent, the result is in one instance a *Cattleya*, but in no less than four others a *Lælia*. So that the influence is now transferred to the side of the pollen-parent. But in the last case the result is yet more remarkable. If *Cattleya* be crossed with *Sophronitis*, the hybrid product belongs to neither of the parent genera, but to yet a third, namely, *Lælia*.

One case included in the above deserves a closer examination. *Cattleya Mossiæ* (a form of *C. labiata*) crossed with *Lælia purpurata* is reported to have produced at one time *Cattleya exoniensis* ×, Reichb. f., and at another *Lælia Canhamiana* ×, Reichb. f. It is only fair, however, to add that in the former case the parentage was not so carefully recorded as in the latter, leaving perhaps a slight possibility of some mistake †.

\* The plant in question is the old *Goodyera discolor*, Ker, now *Hemaria discolor*, Lindl., and not a true *Goodyera*. But it generally goes under the old name in gardens; and for the purpose of this Table it is convenient to retain the name under which the hybrids were described. Later in this paper it is mentioned under its true name.

† I have it on the authority of the Messrs. Veitch that the pedigree of some of their early hybrids was not so carefully recorded as it has been in more recent years.

The value of such a system is at once apparent. To take the case of *Phaius grandifolius*, Lour., crossed with the pollen of *Calanthe vestita*, Wall. These two genera are placed by Bentham in distinct subtribes, and at least are sufficiently distinct, whether the subtribal difference be maintained or not. But when the hybrid flowered, it was described by Prof. Reichenbach\* as *Phaius irroratus* ×; and this author then reduced *Calanthe vestita*, Wall., to *Phaius vestitus*, Reichb. f.; thus removing the plant from its immediate allies, and placing it in a position for which there is no justification. On the same grounds, the distinction between *Cattleya* and *Lalia* has been held to be merely an artificial one, and *Sophranitis* abandoned, except for a single species, which does not materially differ from the remaining ones, and should stand or fall with them. If the future naming of bigeneric hybrids is to be conducted on these principles, there is no telling where we shall ultimately be landed, as the list is likely to be considerably augmented in the future.

On the other hand, we have the course adopted by Dr. Maxwell T. Masters in the case of *Philageria* ×, a hybrid produced by crossing *Lapageria rosea*, Ruiz and Pav., with the pollen of *Philesia buxifolia*, Lam. This name was compounded from that of the two parents, the plant being called *Philageria* × *Veitchii*, Mast.† Such a course seems perfectly legitimate, and one which forms a precedent that may safely be followed in other similar cases.

Before, however, examining these hybrids in detail, it will be as well to consider them in their general bearing upon classification. The question was propounded by Mr. Harry J. Veitch in his paper on "The Hybridization of Orchids"‡ read before the Orchid Conference, "How will these bigeneric crosses affect the stability of the genera as at present circumscribed? And what changes of nomenclature will be necessary to place the Orchidæ on an intelligible basis as regards names?"

To answer these queries aright both the positive and negative results of hybridization must be considered. As to positive

\* Gard. Chron. 1867, p. 264, with fig.

† Ibid. 1872, p. 358, figs. 119, 120.

‡ Ibid. 1885, i. pp. 628-632, with numerous figures; also Journ. Hort. Soc. vii. pp. 22-36, with five Plates.



results, besides the hybrids afore-named there is one other, at least, in existence, but which has not yet flowered, namely—

*Selenipedium* crossed with *Cypripedium*.

And of other crosses which have been effected, and capsules produced, but from which no seedlings have been raised, we have

<i>Bletia</i> crossed with <i>Calanthe</i> .	
<i>Acanthophippium</i> crossed with <i>Chysis</i> .	
<i>Chysis</i> .. .. .	<i>Zygopetalum</i> .
<i>Zygopetalum</i> .. .. .	<i>Lycaste</i> .
<i>Odontoglossum</i> .. .. .	<i>Zygopetalum</i> .

Negative results are more difficult to deal with, as several failures may in some instances be followed by success. Still, from the long experience of the Messrs. Veitch in this field, the following extracts from the afore-named paper of Mr. Harry Veitch may be admitted as fairly proven facts. Speaking of *Masdevallia* he says:—

"*Masdevallia*, as a genus, is far more heterogeneous than was at first supposed, whence a mixture of the different sections may not possibly be effected. . . . All attempts to intermix *M. Chimera* and its allies with the brilliant-flowered species have proved fruitless."—*Veitch, Journ. Hort. Soc.* vii. p. 33.

Respecting *Cattleya* and *Lælia*, we find the following:—

"Among *Cattleyas* we find that all the members of the *labiata* group and also the Brazilian species with two-leaved stems, as *C. intermedia*, *C. Aclandiae*, *C. superba*, &c., cross freely with each other and with the Brazilian *Lælias*, which also cross freely with each other. . . . But neither the *Cattleyas* nor the Brazilian *Lælias* will cross freely with the Mexican *Lælia albida*, *autumnalis*, *majalis*, *rubescens*, &c. Numerous crosses have been effected both ways, and capsules have been produced, but the seed has always proved barren. *L. anceps* appears to be an exception; for it seeds freely, whether crossed with a *Cattleya* or with any of the Brazilian *Lælias*."—*Veitch, l. c.* p. 29.

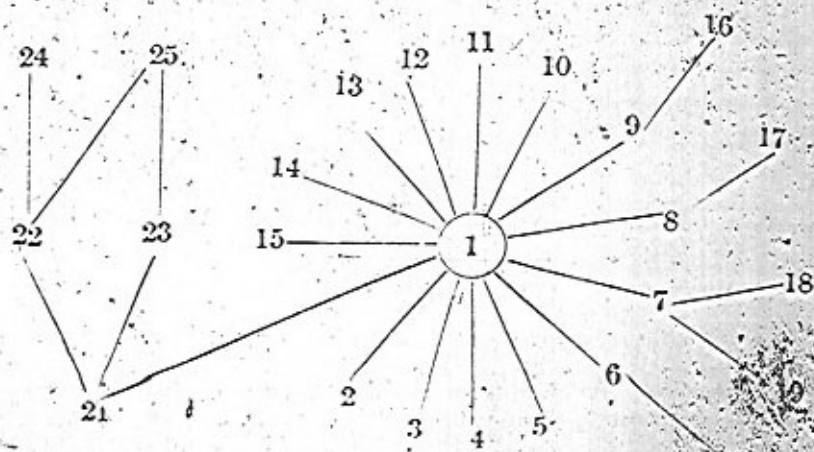
Coming to *Cypripedium*, the genus which of all others has most readily lent itself to the arts of the hybridizer, we find that while seedlings have been raised from the Tropical American *Selenipedium caudatum* crossed with the Indian *Cypripedium barbatum*, yet attempts to cross the Indian species with the North-American *C. spectabile* have not been attended with much success. The cross has been attempted several times, and Mr. Seden has ob-

tained swollen seed-pods, but their contents have invariably turned out to be nothing but chaff; at least, he has never succeeded in inducing any seed to germinate. And there are many other instances within the limits of the Order where species of the same genus, and in some cases closely allied species, have hitherto successfully resisted all the arts of the hybridizer to effect a cross between them.

So that, without insisting too strongly on the value of every item of negative evidence adduced, we are still justified in assuming that while in some instances hybridization may be effected between species belonging to diverse genera, yet in other cases it may not be effected even between species belonging to the same genus.

The question here naturally arises, Are these genera which may be hybridized together really distinct? A negative answer is sometimes given to this query, though an affirmative one is more in harmony with the gradually accumulating evidence on the subject. To deny the distinctness of genera between which hybridization can be (artificially) effected differs only in degree from what was once maintained with respect to species, namely that so-called species which would hybridize together were not really distinct, but only forms of the same species. But this theory is now completely exploded; and it seems to me that, with respect to genera, the idea will also have to be given up, as the analogy between the two cases is so very close. This analogy may be readily expressed in diagrammatic form as follows:—

TABLE I., showing how *Cypripedium barbatum* has been connected with other species by artificial hybridization.



List of Species, the numbers agreeing with those in the foregoing Diagram.

1. <i>Cypripedium barbatum</i> .	14. <i>Cypripedium concolor</i> .
2. — <i>philippinense</i> .	15. — <i>niveum</i> .
3. — <i>Stonei</i> .	16. — <i>purpuratum</i> .
4. — <i>Lowei</i> .	17. — <i>Spicerianum</i> .
5. — <i>Fairrieanum</i> .	18. — <i>Druryi</i> .
6. — <i>superbiens</i> .	19. — <i>Argus</i> .
7. — <i>villosum</i> .	20. — <i>javanicum</i> .
8. — <i>insigne</i> .	21. <i>Selenipedium caudatum</i> .
9. — <i>Lawrenceanum</i> .	22. — <i>Pearcei</i> .
10. — <i>Hookeri</i> .	23. — <i>longifolium (Roetzlii)</i> .
11. — <i>Dayanum</i> .	24. — <i>caricinum</i> .
12. — <i>hirtissimum</i> .	25. — <i>Schlimii</i> .
13. — <i>venustum</i> .	

The above table shows that *Cypripedium barbatum* has been crossed with one species of *Selenipedium* and with fourteen species of *Cypripedium*. Of these fourteen species five have also been crossed with five other species, while the species of *Selenipedium* has been crossed with two other species of that genus, and these again with yet two additional ones. That is, twenty species of *Cypripedium* and five species of *Selenipedium* have been connected by artificial hybridization; and these again have been connected by *Selenipedium caudatum* crossed with *Cypripedium barbatum*; so that all these twenty-five species, of two genera, may be said to be linked together by the skill of the hybridist. The diagram is not arranged to show the various combinations which have been effected between these species, which details can be better expressed as in Table II. (See p. 162.)

From this table we see that thirty-three combinations have been effected between the twenty species of *Cypripedium*, and five combinations between the five species of *Selenipedium*; while the two groups have been connected by the hybrid raised from *Selenipedium caudatum* crossed with *Cypripedium barbatum*\*, or thirty-nine hybrids altogether. All these hybrids, with the exception of the last-named†, have flowered, received distinctive names, and are now in cultivation in various horticultural establishments.

\* "One thing is certain, the three-celled ovary of the Selenipeds offers no impediment to fertilization by the pollinia of Cypripeds with a one-celled ovary, for we have plants raised from *C. caudatum* [*Selenipedium*] × *C. barbatum*, and many other like crosses have yielded seed."—Veitch, *Journ. Hort. Soc.* n. s. vii. p. 30.

† This hybrid is in many respects a remarkable one. It was raised about 1872; and although the plants continue strong and healthy in appearance, and increase in size every year, yet up to the present time not a single plant has flowered.

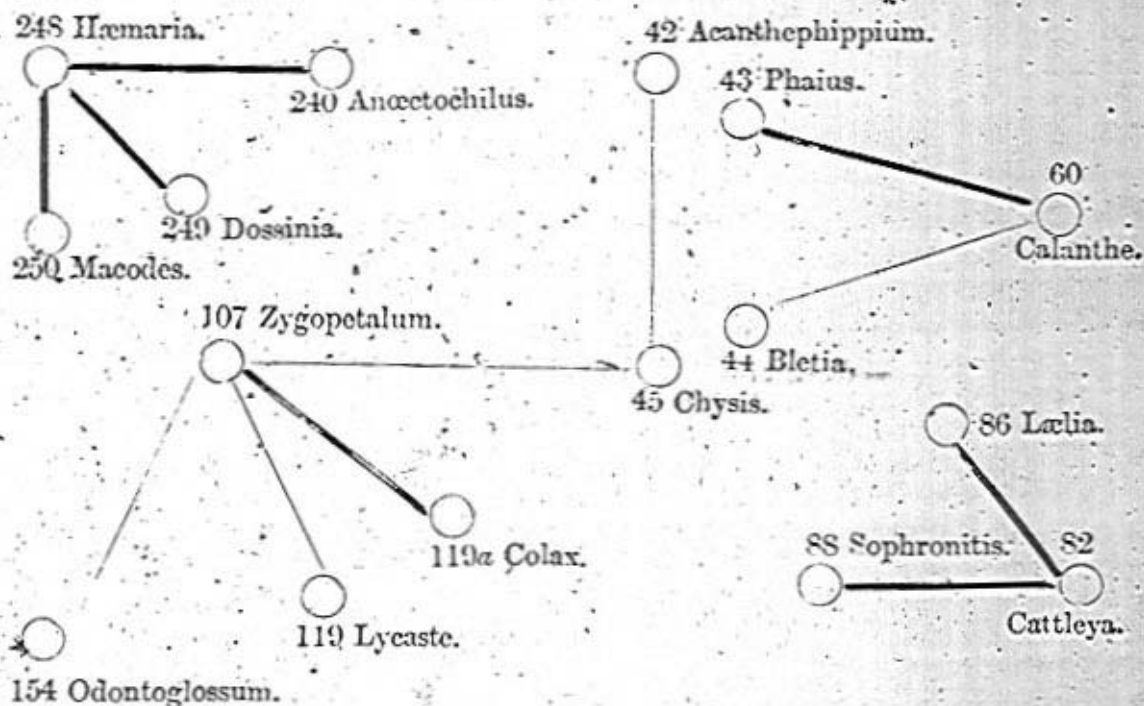




the possibility of the whole of the tropical species of these two genera being ultimately connected in this manner.

We have now the question of hybridism between distinct genera to consider, and, as before, the results obtained can best be expressed in diagrammatic form.

TABLE III., showing the connections which have been obtained between distinct genera by artificial hybridization.



Four distinct diagrams are here represented, and with no connection between them, though it is convenient to place them side by side. The thick lines represent bigeneric hybrids which have flowered and been described; the thin ones represent crosses which have been effected and capsules produced, but from which no seedlings were raised\*. The numbers preceding the names

\* "When we enumerate the capsules which have been obtained from bigeneric crosses, but from which no seedlings have been raised, the list is somewhat more formidable. Some of the most remarkable of these were produced by *Acanthephippium Curtisii* × *Chysis bractesecens*, *Bletia hyacinthina* × *Calanthe masuca*, *Chysis aurea* × *Zygopetalum Sedeni* [itself a hybrid.—R. A. R.], *Odontoglossum hickoniense* × *Zygopetalum maxillare*, and *Zygopetalum Mackayi* × *Lycaste Skinneri*. But, on the other hand, we have obtained a large number of capsules of the normal size, and to all appearance externally perfect, not only from bigeneric crosses, but even between species of the same genus, which contained not a single seed. And, lastly, I may note that *Zygopetalum Mackayi* has been crossed with several species of *Odontoglossum*, and seedlings raised from some of the crosses; but every one that has yet flowered has proved to be *Zygopetalum Mackayi*."—Veitch, *Journ. Hort. Soc.* n. s. vii. p. 35.

are taken from Bentham and Hooker's 'Genera Plantarum,' and are given to show the relative positions of the genera in the system of classification there adopted.

The above diagram is extremely instructive, and fully bears out the analogy pointed out between this and the preceding case. We may consider existing hybrids first.

The four genera *Anæctochilus*, *Hæmaria*, *Dossinia*, and *Macodes* belong to the tribe *Neottieæ*; and, though closely allied, they possess certain structural differences which have been used for generic distinction. An interesting point in connection with this group is that *Hæmaria* has been crossed with each of the other three genera, *Hæmaria discolor*, Lindl., being in each case one of the parents. In two of the cases it was the seed-parent; and although particulars are not fully given in the third case, still I strongly suspect in this also it was the seed-parent.

The three genera *Cattleya*, *Lælia*, and *Sophronitis* belong to Bentham's subtribe *Læliæ*, and are confessedly closely allied; but the structural differences are such as to preclude the idea of uniting them together. The former has four pollen-masses, the two latter have eight; and to give up the characters derived from the number of pollen-masses would be to disown one of the characters universally relied on for generic distinction. So important, indeed, has the character been considered, that Prof. Reichenbach, in the sixth volume of Walpers's 'Annales,' reduced *Cattleya* and two other genera to *Epidendrum*, and *Lælia* and four others to *Bletia*, on these very grounds, yet left *Sophronitis* as distinct. Lately, in a recent issue of that splendidly illustrated work, 'Sander's Reichenbachia,' he again inculcates the same views\*.

On the other hand, so many hybrids have been raised between *Cattleya* and *Lælia*, that Mr. Veitch, in the afore-mentioned papers, relying on this very fact and on the difficulty of saying to which of the two genera some of these hybrids should be referred (and they have always been referred to one or the other, sometimes very arbitrarily), remarked that the distinction between *Cattleya* and *Lælia* "was confessedly an artificial one." If we

\* "I have never endeavoured to thrust upon amateurs such undoubtedly necessary changes as the merging of the genus *Cattleya* into *Epidendrum*, or *Lælia* and *Schomburgkia* into the genus *Bletia*."—Reichb. f. in Sander's *Reichenbachia*, sub t. 25.

try to harmonize these two views, we are reduced to the necessity of merging the whole range of genera from *Epidendrum* to *Bletia* into one.

*Colax* and *Zygopetalum* (the former reduced by Bentham to *Lycaste*, but here restored) belong to the subtribe *Cyrtopodieæ*; but as considerable differences exist in the structure of the pollinarium, they are placed twelve genera apart. In fact, Bentham makes two groups, one with an elongated stipes on which the pollen-masses are seated, the other having them sessile on the gland; *Colax* is placed in the former group, and *Zygopetalum* in the latter. So here, again, structural differences preclude the idea of merging the two genera in one. And if this were done, new characters must be sought for subdividing the *Cyrtopodieæ*, or the nineteen genera be reduced to very few.

The case of *Phaius* and *Calanthe* is yet more remarkable, as they are placed in distinct subtribes by Bentham—*Phaius* in *Bletideæ*, and *Calanthe* in *Cælogyneæ*. So that in this case, to unite the two genera would be to unite the two subtribes in one; and how many genera would follow suit it is difficult to say—that is, assuming Bentham's views as to the gap which separates these two genera to be substantially correct. Structurally different they certainly are; and in this, as in the preceding cases, the differences are such as have hitherto been relied on as sufficient for generic distinction. If these structural differences are to be ignored because the plants possessing them can be hybridized together, the whole system of classification will be thrown into confusion. Indeed it would be kept in a state of perpetual ferment, as the advent of every new bigeneric hybrid would furnish the opportunity of overhauling existing arrangements in order to bring them into harmony with new discoveries.

It may be that some of these are already foreshadowed by the connections represented by the thin lines on the above diagram—crosses effected and capsules produced, but no seedlings raised. Future experiments in this direction may be attended with greater success, as has already been the case in several other instances. At present these cases can only be considered as indicating future possibilities; yet as capsules were produced, the fertilizing influence of the pollen cannot be doubted. These are not cases where, as Darwin puts it, the pollen had no more effect, when applied to the stigma, than so much inorganic dust. Passing them briefly in review, we may first take *Acanthephip-*



*pium* crossed with *Chysis*. These two genera are very closely allied, the two genera placed between them by Bentham being *Phaius* and *Calanthe*. *Zygopetalum* crossed with *Lycaste* furnishes an almost parallel case to the same genus crossed with *Colax*; and therefore calls for no special comment. *Bletia* crossed with *Calanthe* is almost analogous with *Phaius* crossed with *Calanthe*, as *Bletia* and *Phaius* stand together in *Bletideæ*, while *Calanthe* is placed in *Cælogyneæ*. *Odontoglossum* crossed with *Zygopetalum* is an interesting connection, the former being placed in *Oncidiæ*, the latter in *Cyrtopodiæ*. The same genera, crossed the reverse way, are mentioned in a footnote on p. 163. In that case the result of the cross was always simply *Z. Mackayi* (the mother plant), a fact somewhat difficult to account for. But the last connection is a very remarkable one, namely, *Chysis* crossed with *Zygopetalum*. *Chysis* belongs to the tribe *Epidendreæ*, *Zygopetalum* to *Vandeæ*. As to these primary divisions of the Order, no difference of opinion exists between botanists; and the pollinaria are so different in the two cases, that the results of future experiments in this direction, either as confirming or disproving the possibility of hybridization between such diverse genera, will be awaited with great interest.

We therefore see that the results of hybridization in this Order have been of a remarkable and somewhat unlooked-for nature—results which may or may not have a very important bearing upon classification, according to the light in which they are considered. Hitherto, as we have already seen, bigeneric hybrids have either been placed in one of the parent genera, or some rearrangement has been proposed in order to harmonize with the supposed new discoveries. If this course is to be persisted in, no finality can ever be anticipated while these hybridizing experiments continue. *Calanthe Dominii*, raised between *C. masuca* and *C. furcata*, was the first artificial hybrid Orchid which flowered. When, in October 1856, it was shown to Dr. Lindley, he remarked to the late Mr. Veitch, "Why! you will drive the botanists mad." And if our ideas of classification must be taken from the hybridist, there is much truth in the remark. I do not, however, think such a course is either desirable or necessary. These hybrids are mostly artificial productions; and, for various reasons, very few of them may be expected to occur in a state of nature. Over a hundred have been raised in gardens in this country; and of these only two are known in a wild state. *Phalænopsis inter-*



*media*, described many years ago, has recently been raised by the Messrs. Veitch, by crossing *P. Aphrodite* with *P. rosea*; and *Cypripedium Morgania*, raised between *C. Stonei* and *C. superbiens*, is so substantially similar to the wild *C. Stonei*, var. *platytanium*, that the latter is now supposed to be a natural hybrid between these two species.

From the foregoing details we may make the following deductions; and these again indicate a method of treating these hybrids which seem to me at once unobjectionable in itself, and does not interfere with the existing classification of genera and species:—

1. Hybridization may take place not only between distinct species, but also between distinct genera—or between plants so structurally different as to be usually regarded as such.

2. These hybrids are generally of artificial origin, or accidentally produced, and cannot be treated in the scheme of classification either as varieties, species, or genera.

3. The possibility of hybridization taking place between species hitherto considered as distinct does not necessarily prove them to be merely forms of the same species.

4. The occurrence of a hybrid between two structurally different genera does not prove the necessity of uniting them in one; nor can such hybrids be arbitrarily referred to either of the parent genera.

5. Species, and genera too, will always have to be dealt with in the scheme of classification according to their structural peculiarities and differences, without reference to the possibility of hybridization taking place between them.

It is therefore clear that hybrids, whether bigeneric or otherwise, should be dealt with on their own merits, and named in such a way as to avoid all confusion between them and existing species and genera. In the case of species the common practice has been to give to a hybrid a new specific name, followed by a "×" to indicate the hybrid origin of the plant. Thus *Cypripedium Harrisianum* × is a hybrid raised from *C. villosum* crossed with *C. barbatum*; though, to my mind, a name indicating at once its hybrid origin and parentage, as *C. barbato-villosum*, would have been preferable. In the case of bigeneric hybrids it seems to me that the plan of compounding a name from that of the two parents should always be followed, as "*Philageria* ×," a name invented by Dr. Masters for a hybrid raised by crossing *Lapa-*

*geria rosea* with the pollen of *Philesia buxifolia*. By this means all confusion between them and natural genera would be avoided.

The rest of this paper is devoted to carrying this idea into practice for the bigeneric hybrids already in existence.

**PHAIOCALANTHE** ×.—This name is proposed for the hybrids produced between *Phaius* and *Calanthe*—two very distinct genera, and placed by Bentham in distinct subtribes. The former genus has been the seed-parent in the crosses at present effected; and on the principle of placing the name of the pollen-parent first, some would have used the names the reverse way. But this does not seem to me a matter of vital importance, as in two of the following cases crosses have been effected both ways. The essential point seems to be to compound some euphonious name from that of the two parent genera, which shall serve as a sort of artificial genus for all the hybrids produced between those genera. Were the rule of placing the name of the pollen-plant first to be always adopted in compounding new names for bigeneric hybrids, it would, in the case of *Cattleya* and *Lælia* (and in other cases), lead to two names being used for practically the same thing, a course which seems both undesirable and unnecessary.

**P. × IRRORATA**.—*Phaius irroratus*, Reichb. f. in *Gard. Chron.* 1867, p. 264, with fig.; also 1882, pt. 2, p. 565, fig. 100; *Fl. Mag.* t. 426.—A hybrid produced between *Calanthe vestita*, Wall., ♂, and *Phaius grandiflorus*, Lour., ♀, and partaking of the characters of both parents. The cross was effected a second time; and as the progeny in this case proved somewhat darker in colour, it was called var. *purpureus*. For the present purpose, however, these colour-varieties need not be taken account of, as variation in this respect in the hybrid offspring is readily induced by selecting different colour-varieties in the parents\*.

**LÆLIOCATTELEYA** ×.—Proposed for the hybrids between *Lælia* and *Cattleya*, the species of which readily hybridize together. The species of these genera have eight or four pollen-masses

\* *Phaius inquilinus*, Reichb. f. in *Gard. Chron.* 1867, p. 544, might appear to come under *Phaiocalanthe* ×, as its parents are said to be, probably (the record being lost), *Phaius vestitus* and *Calanthe masuca* or *C. versicolor*. *Phaius vestitus* (Reichb. f. in *Gard. Chron.* 1867, p. 264, in note under *P. irroratus*), however, is simply *Calanthe vestita*, Wall., a genuine *Calanthe*, which never ought to have been called *Phaius* at all. So that *P. inquilinus* is not a bigeneric hybrid, but a true *Calanthe*, which may stand as *C. inquilina* ×.

respectively; but the hybrids between them are so irregular in this respect, that the greatest confusion exists between the two genera. By separating these hybrids as proposed, the boundaries of the two genera will be clearly defined.

L. X AMESIANA.—*Lælia Amesiana* ×, *Reichb. f. in Gard. Chron.* 1884, pt. 1, p. 109.—A hybrid raised between *Cattleya maxima*, Lindl., ♂, and *Lælia crispa*, Reichb. f., ♀.

L. X BELLA.—*Lælia bella* ×, *Reichb. f. in Gard. Chron.* 1884, pt. 1, p. 174.—A hybrid raised between *Cattleya labiata*, Lindl., ♂, and *Lælia purpurata*, Lindl., ♀.

L. X CALLISTOGLOSSA.—*Lælia callistoglossa* ×, *Reichb. f. in Gard. Chron.* 1882, pt. 1, p. 76.—A hybrid raised between *Cattleya Warszewiczii*, Reichb. f. (one of the multitudinous forms of *C. labiata*, Lindl.), ♂, and *Lælia purpurata*, Lindl., ♀.

L. X CANHAMIANA.—*Lælia Canhamiana* ×, *Reichb. f. in Gard. Chron.* 1885, pt. 2, p. 6.—A hybrid raised between *Lælia purpurata*, Lindl., ♂, and *Cattleya Mossiæ*, Lindl. (a form of *C. labiata*, Lindl.), ♀.

L. X EXONIENSIS.—*Cattleya exoniensis* ×, *Reichb. f. in Gard. Chron.* 1867, p. 1144; *Jennings, Orch.* t. 1.—Said to have the same parentage as the preceding, but the plant is so different that some mistake has probably been made.

L. X FELIX.—*Cattleya felix* ×, *Reichb. f. in Gard. Chron.* 1876, pt. 2, p. 68.—A hybrid raised between *Cattleya Schilleriana*, Reichb. f., ♂, and *Lælia crispa*, Reichb. f., ♀.

L. X MYLAMIANA.—*Lælia Mylamiana* ×, *Reichb. f. in Gard. Chron.* 1876, pt. 2, p. 740, fig. 138.—A hybrid raised between *Lælia crispa*, Reichb. f., ♂, and *Cattleya granulosa*, Lindl., ♀.

L. X PHILBRICKIANA.—*Lælia Philbrickiana* ×, *Reichb. f. in Gard. Chron.* 1879, pt. 2, p. 102.—A hybrid raised between *Lælia elegans*, Reichb. f., ♂, and *Cattleya Acklandiæ*, Lindl., ♀.

L. X VEITCHIANA.—*Lælia Veitchiana* ×, *Reichb. f. in Gard. Chron.* 1874, pt. 1, p. 566; *Fl. Mag.* n. s. t. 305.—A hybrid raised between *Cattleya labiata*, Lindl., ♂, and *Lælia crispa*, Reichb. f., ♀.

SOPHROCATTLEYA ×.—Proposed for a hybrid raised between *Cattleya* and *Sophronitis*, a genus closely allied to *Lælia*.

S. X BATEMANNIANA.—*Lælia Batemanniana* ×, *Reichb. f. in Gard. Chron.* 1886, pt. 2, p. 263.—A hybrid raised between *Sophronitis grandiflora*, Lindl., ♂, and *Cattleya intermedia*, Grah., ♀.